

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RESPONSE UNDER 37 C.F.R. § 1.116
--EXPEDITED PROCEDURE -- EXAMINING GROUP

In Re the Application of:

CROWDER et al.

Serial No.: 09/975,593

Filed: October 10, 2001

Atty. File No.: 3123-379

For: SUSPENSION SWAGE PLATE WITH
APPLIED SOLID FILM LUBRICANT
AND METHOD OF ASSEMBLING
THE SAME

) Group Art Unit: 2651

) Examiner: Kim, P.

) AMENDMENT AFTER FINAL

CERTIFICATE OF MAILING

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SHERIDAN ROSS P.C.

BY:

Christine Jaquet

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313
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Dear Sir:

Applicant submits this Amendment After Final to address the Office Action having a mailing
date of October 6, 2003 (Paper No. 11).

Please amend the above-identified patent application as follows:

AMENDMENTS TO THE CLAIMS:

1. (Withdrawn) In a disk drive of the type including at least one data disk, and an actuator assembly having an actuator arm connected to a suspension arm, the improvement comprising:

5 a lubricant film applied to selected swage contact surfaces wherein said lubricant film helps to prevent failure of the metal components during swaging and de-swaging.

2. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film comprises a polymer.

3. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film comprises a fluorocarbon composition.

4. (Withdrawn) A disk drive, as claimed in Claim 2, wherein said lubricant film comprises a fluoroalkylmethacrylate.

5. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film comprises a solid film.

6. (Withdrawn) A disk drive, as claimed in Claim 5, wherein said lubricant film is produced from CHF_3 gas.

7. (Withdrawn) A disk drive as claimed in Claim 1, wherein:

said actuator arm includes a distal end and an opening formed in said distal end, said opening being defined by an inner surface, said suspension arm being connected to said actuator arm by a swage boss extending from a swage plate attached to said suspension arm, said sage boss being swaged with said opening, and wherein said selected swage contact surfaces include at least one of said opening and an outer surface of said boss.

8. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant polymer film is applied up to a thickness of 2700 angstroms.

9. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is a monolayer.

10. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is applied by immersing the selected swage contact surfaces in a dilute solution of the lubricant film, and draining the solution from said swage contact surfaces or raising the selected swage contact surfaces out of the solution at a desired rate.

11. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is deposited upon said swage contact surfaces by a vacuum deposition process.

12. (Withdrawn) A disk drive, as claimed in Claim 1, wherein said lubricant film is deposited on said swage contact surfaces by spraying.

13. (Currently Amended) A method of assembling an actuator assembly of a disk drive, said method comprising the steps of:

providing an actuator arm having a proximal end and a distal end;

providing a suspension arm having a proximal end and a distal end;

5 fixing a swage plate to the proximal end of the suspension arm, said swage plate including a swage boss extending therefrom, said swage boss having an inner surface that contacts a swage ball during swaging, and an outer surface not contacted by the swage ball during swaging;

depositing a film lubricant upon at least ~~an~~ the outer surface of said swage boss; and

10 attaching the suspension arm to the actuator arm by swaging the swage boss to an opening formed in the distal end of the actuator arm.

14. (Original) A method, as claimed in Claim 13, further including the step of:

depositing a film lubricant on the opening in said distal end of the actuator arm prior to said attaching step.

15. (Original) A method, as claimed in Claim 13, wherein:
said film is deposited upon the swage boss by immersing the swage boss in a dilute solution containing the film lubricant, and then draining the solution at a selected rate or raising the swage boss out of the coating solution at a desired rate.
16. (Original) A method, as claimed in Claim 13, wherein said film lubricant is deposited upon the swage boss by spraying.
17. (Original) A method, as claimed in Claim 13, wherein said film lubricant is deposited upon the swage boss by vacuum deposition.
18. (Original) A method, as claimed in Claim 13, wherein said film lubricant is a polymer film.
19. (Original) A method, as claimed in Claim 13, wherein said film lubricant is a solid film.
20. (Original) A method, as claimed in Claim 18, wherein said polymer comprises fluorocarbon.

21. (Original) A method, as claimed in Claim 19, wherein said solid film comprises fluorocarbon.

22. (Previously Presented) A method of reducing torque out retention values between an actuator arm and a suspension arm of a disk drive which are connected by swaging, said method comprising the steps of:

providing swage contact surfaces including an outer surface of a swage boss; and

5 applying a lubricant film coating to said outer surface, thus providing lubrication in a subsequent de-swaging process.

23. (Original) A method, as claimed in Claim 22, wherein:

said lubricant film coating is applied to said swage contact surfaces by immersing said swage contact surfaces in a dilute solution containing the lubricant film coating, and then draining the solution or raising the swage contact surfaces out of the lubricant film coating solution at a selected
5 rate.

24. (Original) A method, as claimed in Claim 22, wherein said lubricant film coating is applied to said swage contact surfaces by spraying.

25. (Original) A method, as claimed in Claim 22, wherein said lubricant film coating is applied to said swage contact surfaces by a vacuum deposition process.

26. (Original) A method, as claimed in Claim 22, wherein said film lubricant is a polymer film.

27. (Original) A method, as claimed in Claim 22, wherein said film lubricant is a solid film.

28. (Original) A method, as claimed in Claim 26, wherein said polymer film comprises fluorocarbon.

29. (Original) A method, as claimed in Claim 27, wherein said solid film comprises fluorocarbon.

30. (Withdrawn) In a disk drive of the type including at least one data disk, and an actuator assembly having an actuator arm connected to a suspension arm, the improvement comprising:

means applied to selected swage contact surfaces of the actuator arm and suspension arm for

5 lubricating said surfaces to reduce material failure of said contact surfaces during de-swaging.

31. (Previously Presented) A method, as claimed in Claim 22, further comprising the steps of:

providing an inner surface defining an opening in a distal end of the actuator arm; and

applying a lubricant film coating to said inner surface thus providing lubrication in the

5 subsequent de-swaging process.

REMARKS/ARGUMENTS

In the final Office Action, the Examiner responded to Applicant's prior arguments by stating that the Examiner was unclear as to where the claimed outer surface of the swage boss was located. In this Amendment, Applicant has amended independent claim 13 to further recite that the swage boss has an inner surface that contacts a swage ball during swaging, and an outer surface not contacted by the swage ball during swaging. This amendment to independent claim 13 should thereby clarify the Examiner's concern as to what surface is being claimed as lubricated within claim 13.

This Amendment is being filed concurrently with an Appeal.

Accordingly, Applicant respectfully request that this Amendment After Final be entered in order to place the claims in a better condition for Appeal.

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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